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FATE OF THE HERBICIDE MECOPROP IN MEDITERRANEAN SOILS AMENDED WITH FRESH AND COMPOSTED OLIVE-MILL WASTE

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Olive-mill waste (OMW), a byproduct of the olive oil production process, is often added to Mediterranean agricultural soils as an ecological and economic way for its disposal, and also to improve soil structure, increase soil fertility, and control soil erosion. In this work, laboratory experiments were conducted to assess the effects of two OMWs, fresh and composted, when added at a rate of 5% (w/w) to two agricultural soils (a clay soil and a sandy loam soil), on sorption, degradation, and leaching, of the herbicide mecoprop (MCPP). Addition of fresh and composted OMW to the sandy loam soil equally increased MCPP sorption by about 30%. A more pronounced increase in MCPP sorption was observed when the clay soil was amended with fresh OMW (20% sorption) compared to composted OMW (7% sorption). Fresh OMW enhanced the persistence of MCPP in both soils, whereas the composted OMW had no impact on MCPP persistence. MCPP leaching in soil columns was retarded by the addition of both fresh and composted OMW to the soils, but higher herbicide concentrations were found in leachates from the clay soil treated with fresh OMW, due to the long MCPP persistence in this system. Therefore, OMW addition to agricultural soils can significantly affect the behavior of MCPP and that these effects should be considered to optimize the performance of the herbicide in OMW-amended soils. Acknowledgment: Projects P07-AGR-03077 of Junta de Andalucía and AGL2011-23779 of the Spanish Ministry of Science and Innovation, cofinanced with FEDER-FSE funds.